

C L A I M S

1. A multifunctional key adapted to be used in an input/output device, the multifunctional key comprising:

5 a touch surface;

a display means provided adjacent to said touch surface wherein said display means is adapted to changeably display signs;

whereby keying in said multifunctional key generates an electronic signal corresponding to the sign currently displayed adjacently to said touch surface.

2. A multifunctional key as claimed in Claim 1, wherein said touch surface is transparent.

3. A multifunctional key as claimed in Claim 1, wherein said display means is housed in a housing that rests on a stem; and wherein said stem is adapted to move downwardly when the multifunctional key is keyed in and move upwardly when the multifunctional key is released.

4. A multifunctional key as claimed in Claim 3, wherein said stem is moving upwardly by the force of an elastomeric pad that resides in the input/output device beneath the multifunctional key.

5. A multifunctional key as claimed in Claim 1, wherein said display means is a LED matrix provided beneath adjacent to said touch surface which is transparent.

6. A multifunctional key as claimed in Claim 6, wherein the multifunctional key further comprises:

PCB adapted for placing and interconnecting electronic components;

driver chip adapted to power said LED matrix;
connecting cable adapted to allow communication between
the multifunctional key and the input/output device.

- 5 7. The multifunctional key as claimed in Claim 6, wherein said key's PCB is adapted to communicate with a PCB of the input/output device through contact sensors that are provided in the input/output device.
8. The multifunctional key as claimed in Claim 6, wherein said chip driver is
10 in multiplex mode that outputs low voltage level to cathodes provided in said LED matrix, by turn.
9. The multifunctional key as claimed in Claim 6, wherein said chip driver maintains an average current of about 2 mA.
- 15 10. The multifunctional key as claimed in Claim 6, wherein said connecting cable is provided with 6 wires and wherein a first wire is VDD – chip power voltage; second wire is CLK – clock signal; third wire is DIN – input data and control bit; fourth wire is SW – input signal of normally
20 open key contact; fifth wire is GND – common wire of power, data and second signal contact; and the sixth wire is DO – output data and control bit.
11. A multifunctional key as claimed in Claim 6, wherein said LED matrix
25 comprises 7 columns and 11 rows of LEDs.
12. The multifunctional key as claimed in Claim 11, wherein said driver chip comprises: an 11-digit shift register adapted to receive input data in serial code; row drivers connected to anodes provided in rows in said
30 LED matrix; control circuit adapted to permit current output from said row drivers; column driver adapted to select the column of said LED matrix using a 7-digit looped shift register.

13. A multifunctional keyboard adapted to be used in an input/output device comprising:

5 a plurality of multifunctional keys wherein each multifunctional key comprises a touch surface and a display means provided adjacent to said touch surface wherein said display means is adapted to changeably display signs;

key PCB adapted for placing and interconnecting electronic components;

10 elastomeric pad having a plurality of sensory contacts wherein said elastomeric pad is provided beneath said plurality of multifunctional keys and wherein said elastomeric pad is adapted to uphold said plurality of multifunctional keys in an upward position so as to prevent contact with said sensory contacts when
15 the multifunctional key is in said upward position and to allow contact when one of said plurality of multifunctional keys is keyed in;

keyboard PCB adapted to receive commands from said key PCB;

20 driver chip adapted to power said display means;

At least two keys adapted to allow change of the signs indicated on said plurality of multifunctional keys;

25 whereby keying in one of said at least two keys converts the signs indicated on said plurality of multifunctional keys so that keying in one of said plurality of multifunctional keys generates an electronic signal corresponding to the sign currently displayed on said indicator that is being transferred by said Keyboard PCB to a device that is connected to the input/output device.

- 30 14. A multifunctional keyboard as claimed in Claim 13, wherein said display means is a LED matrix.

15. The multifunctional keyboard as claimed in Claim 14, wherein said LED matrix comprises 7 columns and 11 rows of LEDs and said driver chip comprises an 11-digit shift register adapted to receive input data in serial code; row drivers connected to anodes provided in rows in said LED matrix; control circuit adapted to permit current output from said row drivers; column driver adapted to select the column of said LED matrix using a 7-digit looped shift register.
16. A multifunctional keyboard as claimed in Claim 13, wherein a connecting cable connected said key PCT and said keyboard PCB, and wherein said connecting cable is provided with 6 wires and wherein a first wire is VDD – chip power voltage; second wire is CLK – clock signal; third wire is DIN – input data and control bit; fourth wire is SW – input signal of normally open key contact; fifth wire is GND – common wire of power, data and second signal contact; and the sixth wire is DO – output data and control bit.
17. The multifunctional keyboard as claimed in Claim 13, further comprising at least one key that is adapted to transfer electronic signals through said keyboard PCB when keyed in.
18. A multifunctional keyboard as claimed in Claim 13, wherein said multifunctional keyboard acts as an input/output device to devices selected from a group comprising a computer, a mobile computer, hand computer, telephone devices, controllers, a remote control and other devices.
19. A multifunctional keyboard as claimed in Claim 13, wherein said multifunctional keyboard is connected to a computer based on an actuating system such as windows, OS2, LINUX, UNIX, SOLARIS, or DOS.

20. A multifunctional keyboard as claimed in Claim 13, wherein said signs
are selected from a group such as fonts, computer language signs,
chemical structures, amino acids, DNA codes, pictures, music notes, or
car parts.